Automatic Street Light

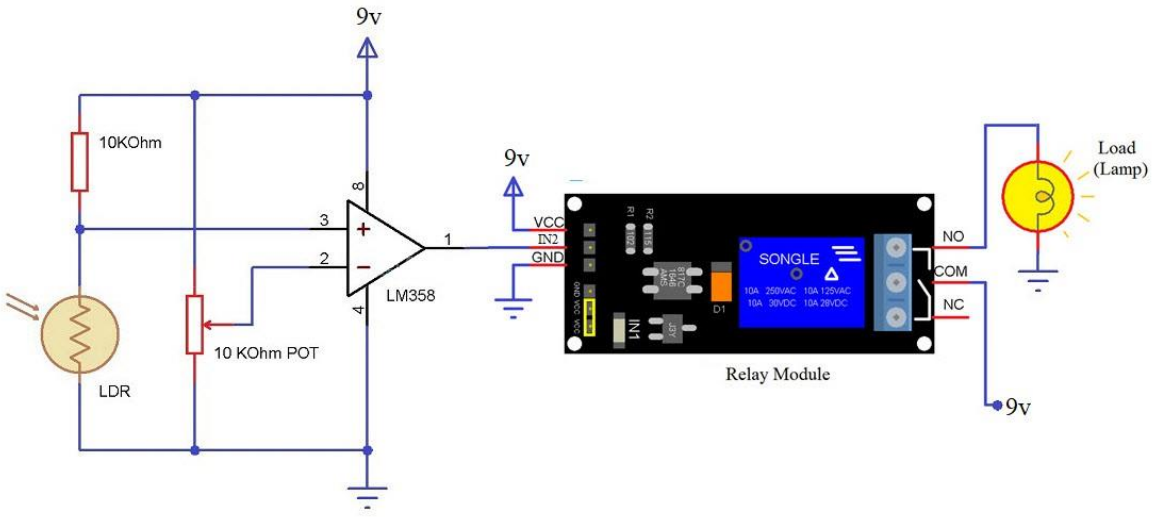
Introduction

Many people have a phobia of darkness, so to assist them in such situations, we have explained a simple circuit that will automatically turn on the street light consisting of LEDs or bulb coupled with relay. It is lit well enough to see the objects nearby.

This circuit is very easy to work around and also it is battery operated. The power consumed by the circuit is very low because of the very few components used in the circuit.

The whole circuit is based on IC LM358, which is basically an operational amplifier that is configured in a voltage comparator. LDR (Light depending resistor), whose resistance is based upon the quantity of the light falling on it, is the main component for sensing the light. Along with these, a few more components are also used.

Circuit Diagram



Component

- IC LM358 – 1
- Resistor 10KΩ – 1
- Potentiometer 10KΩ – 1
- 5V Relay Module – 1
- Small LED Strip
- 9V Battery
- LDR – 1
- Connecting Wires
- Breadboard

Components Description

- **LM358**
  It is an Operational Amplifier IC. It is available ib 8-pin DIP Package and can be used in several configurations like Amplifier, oscillator, comparator etc.
- **LDR**
  LDR is a device whose sensitivity depends upon the intensity of light falling on it. When the strength of the light falling on LDR increases the LDR resistance decreases, while if the strength of the light falls on LDR is decreased, its resistance increased.
  In the time of darkness or when there is no light, the resistance of LDR is in the range of mega ohms, while in the presence of light or in brightness in decrease by few hundred ohms.
- **Testing of LDR**
  Before mounting any component in the circuit it is a good practice to check whether a component works properly or not so that you can avoid consumption of time in troubleshooting. For testing LDR set the range of multimeter in resistance measurement. Measure the resistance of LDR in the light or brightness and the resistance must be low. Now, cover the LDR properly so that no light falls on it and once again measure the

resistance. It must be high. If you got the satisfactory result, then your LDR is good.

- **Resistor**
  It is a passive component having two terminals that is used to manage the current flow in the circuit. A current that flows via a resistor is directly proportional to the voltage that appears across the resistor.
  Resistors are of two types –

i) Fixed Resistor – having a fixed value of resistance
ii) Variable Resistor – whose value of resistance can be changed for example if we have a resistor of 5K then the value of resistance will vary from 0 to 5 k.

Value of resistance can be calculated with the help of multimeter or with the colour code that is visible on the resistor.

- **Relay**
  It provides isolation between the controller and the device because as we know devices may work on AC as well as on DC but they receive signals from microcontroller which works on DC hence we require a relay to bridge the gap. The relay is extremely useful when you need to control a large amount of current or voltage with the small electrical signal.

Advantage

- By using this Automatic system for street light controlling, we can reduce energy consumption because the manually operated street lights are not switched off properly even the sunlight comes and also not switched on earlier before sunset.

- In sunny and rainy days, ON and OFF time differ noticeably which is one of the major disadvantage of using timer circuits or manual operation for switching the street light system.